



P.O. Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

A GYRO TECHNOLOGIES INC. COMPANY

March 15, 2013

15-40539

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo



RE: Carmen 3 Federal Com No. 015H

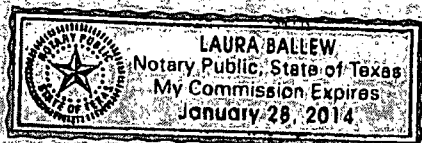
Please find enclosed a copy of the survey from 0.00' to 5100.00' ran on the above referenced well.

Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
§
COUNTY OF NUECES §

This instrument was acknowledged before me on the 15th day of March, A.D. 2013, by Keith Havelka.

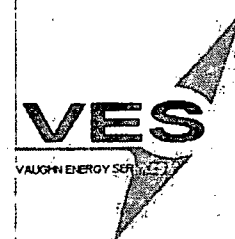



Laura Ballew
Notary Public, State of Texas

Company: COG Operating, LLC (Concho)
Lease/Well: Carmen 3 Federal Com / No. 015H



Rig Name: JW #2
State/County: New Mexico / Eddy
Latitude: 32.87, Longitude: -103.95
GRID North is 0.21 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 18.5'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...3 fed com #15h gyro survey.ut

Minimum Curvature Method

Report Date/Time: 3/15/2013 / 13:05

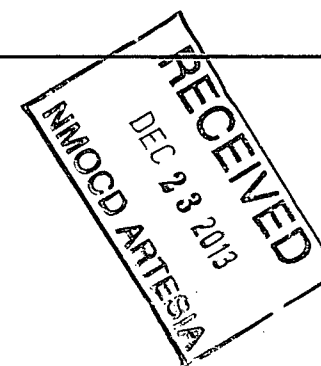
Vaughn Energy Services

Midland, Texas

432-563-5444

Survey Engineer: Logan Henry

Carmen 3 Federal Com No. 015H / API 30-016-40539

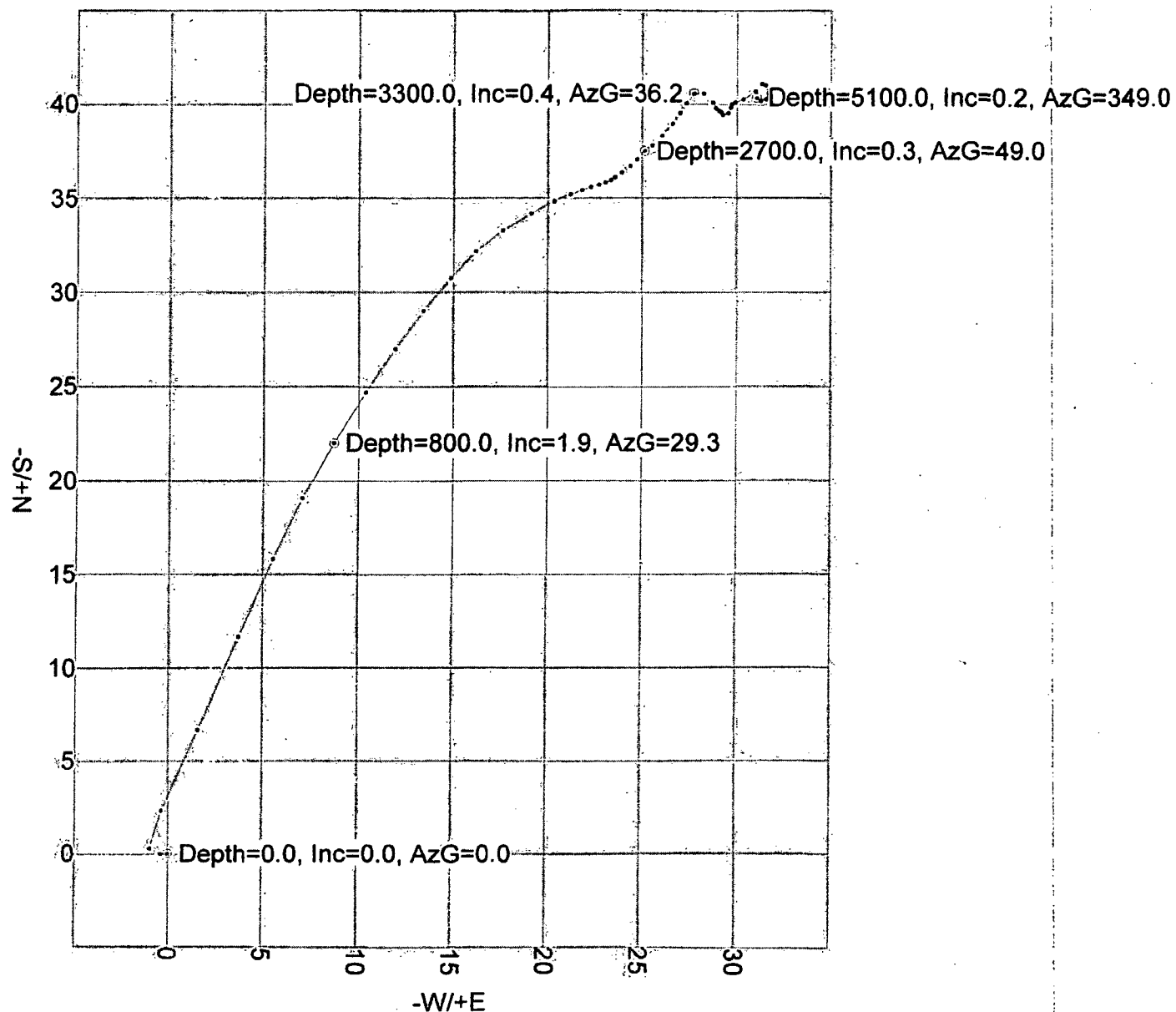


Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.44	267.15	100.00	-0.02	-0.38	-0.02	0.38	267.15	0.44
200.00	0.43	329.20	200.00	0.28	-0.95	0.28	0.99	286.47	0.45
300.00	2.18	24.76	299.97	2.33	-0.35	2.33	2.35	351.48	1.97
400.00	3.27	23.22	399.85	6.67	1.57	6.67	6.85	13.25	1.09
500.00	2.97	23.24	499.71	11.67	3.71	11.67	12.24	17.66	0.30
600.00	2.21	24.04	599.60	15.81	5.52	15.81	16.75	19.26	0.76
700.00	1.91	27.96	699.54	19.05	7.09	19.05	20.33	20.43	0.33
800.00	1.95	29.25	799.48	22.01	8.71	22.01	23.67	21.59	0.05
900.00	1.69	34.59	899.43	24.70	10.37	24.70	26.79	22.78	0.31
1000.00	1.50	34.55	999.39	26.99	11.95	26.99	29.51	23.88	0.19
1100.00	1.37	38.07	1099.36	29.01	13.43	29.01	31.96	24.84	0.16
1200.00	1.23	40.94	1199.34	30.75	14.86	30.75	34.16	25.80	0.16
1300.00	1.02	46.15	1299.32	32.18	16.20	32.18	36.03	26.73	0.23
1400.00	1.03	58.13	1399.30	33.27	17.61	33.27	37.64	27.90	0.21
1500.00	0.97	59.59	1499.29	34.17	19.11	34.17	39.15	29.21	0.07
1600.00	0.62	63.49	1599.28	34.84	20.32	34.84	40.34	30.25	0.36
1700.00	0.46	69.15	1699.27	35.23	21.18	35.23	41.10	31.02	0.17
1800.00	0.29	69.77	1799.27	35.46	21.80	35.46	41.62	31.58	0.17

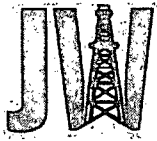
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.28	70.47	1899.27	35.63	22.27	35.63	42.01	32.00	0.02
2000.00	0.23	75.92	1999.27	35.76	22.69	35.76	42.35	32.40	0.05
2100.00	0.18	68.43	2099.27	35.86	23.03	35.86	42.62	32.70	0.06
2200.00	0.19	58.24	2199.27	36.01	23.31	36.01	42.90	32.92	0.04
2300.00	0.10	55.25	2299.27	36.15	23.53	36.15	43.13	33.06	0.09
2400.00	0.41	54.58	2399.26	36.40	23.89	36.40	43.54	33.28	0.31
2500.00	0.23	50.42	2499.26	36.74	24.34	36.74	44.07	33.52	0.18
2600.00	0.37	43.03	2599.26	37.10	24.71	37.10	44.57	33.66	0.14
2700.00	0.30	49.05	2699.26	37.50	25.12	37.50	45.14	33.82	0.07
2800.00	0.30	51.70	2799.26	37.84	25.53	37.84	45.64	34.01	0.01
2900.00	0.51	43.87	2899.26	38.32	26.04	38.32	46.33	34.20	0.22
3000.00	0.47	36.00	2999.25	38.98	26.59	38.98	47.18	34.30	0.08
3100.00	0.34	34.46	3099.25	39.55	27.00	39.55	47.89	34.32	0.14
3200.00	0.35	34.48	3199.25	40.05	27.34	40.05	48.49	34.32	0.01
3300.00	0.41	36.21	3299.25	40.58	27.72	40.58	49.15	34.34	0.06
3400.00	0.47	134.15	3399.24	40.58	28.23	40.58	49.44	34.82	0.67
3500.00	0.31	134.75	3499.24	40.10	28.72	40.10	49.33	35.61	0.16
3600.00	0.12	200.34	3599.24	39.81	28.88	39.81	49.18	35.95	0.28
3700.00	0.23	98.11	3699.24	39.68	29.03	39.68	49.17	36.19	0.28
3800.00	0.10	243.24	3799.24	39.61	29.15	39.61	49.18	36.34	0.32
3900.00	0.24	120.29	3899.24	39.47	29.25	39.47	49.12	36.54	0.31
4000.00	0.25	28.23	3999.24	39.56	29.53	39.56	49.36	36.74	0.35
4100.00	0.10	15.40	4099.24	39.84	29.66	39.84	49.67	36.67	0.15
4200.00	0.11	17.56	4199.24	40.02	29.71	40.02	49.84	36.59	0.01
4300.00	0.17	85.45	4299.24	40.12	29.89	40.12	50.03	36.68	0.16
4400.00	0.39	62.15	4399.24	40.30	30.33	40.30	50.44	36.97	0.25
4500.00	0.49	52.03	4499.23	40.72	30.97	40.72	51.16	37.26	0.12
4600.00	0.16	9.81	4599.23	41.11	31.33	41.11	51.69	37.31	0.38
4700.00	0.31	140.98	4699.23	41.04	31.52	41.04	51.75	37.52	0.43
4800.00	0.25	187.84	4799.23	40.62	31.66	40.62	51.50	37.94	0.23
4900.00	0.16	225.46	4899.23	40.30	31.53	40.30	51.17	38.04	0.16
5000.00	0.21	275.53	4999.23	40.22	31.24	40.22	50.93	37.84	0.16
5100.00	0.15	348.95	5099.23	40.36	31.04	40.36	50.92	37.56	0.22



Vaughn Energy Services
Midland, Texas
432-563-5444
Survey Engineer: Logan Henry
Carmen 3 Federal Com No. 015H / API 30-015-40539



VES Survey Date: 03/12/2013



DRILLING INC. Oil Well Drilling Contractor

Post Office Box 160 Artesia, New Mexico 88211-0160 Office (575) 748-8704 Fax (575) 748-8719

March 18, 2013

COG Operating, LLC
One Concho Center 600 W. Illinois Ave
Midland, Texas 79701

Re: Carmen 3 Federal Com # 15 H
Sec. 3, T-17-S, R-30-E
Eddy County, New Mexico

Attn: Jim Evans

The following is a Deviation Survey on the referenced well in Eddy County, New Mexico:

241' - 1.75°	1317' - 2°	2485' - 0.75°	3887' - 1°
402' - 3.25°	1551' - 0.75°	2956' - 0.75°	4363' - 1.25°
894' - 1.5°	2016' - 0.75°	3425' - 0.5°	4832' - 0.75°

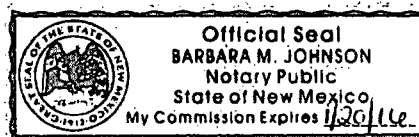
Sincerely,

Gary W. Chappell
Contracts Manager

STATE OF NEW MEXICO)
COUNTY OF EDDY)

The foregoing was acknowledged before me this 18th day of March, 2013 by Gary W. Chappell.

NOTARY PUBLIC



HALLIBURTON

14103 Interwood S. Parkway • Houston, TX 77032

PHONE 281.986.4400 • FAX 281.986.4499

State of New Mexico, Eddy County

I, Jeffrey Moriarty, certify that I am employed by Halliburton Energy Services, Inc. (AKA Sperry Drilling) and that on the dates of 11, March 2013 through 25, March 2013 I did conduct or supervise the taking of DGWD directional surveys for the well Carmen 3 Federal Com 15H from a depth of 5176' MD to a depth of 10130' MD. This data is true, correct, complete and within the limitations of the tools as set forth by Halliburton Energy Services, Inc. (AKA Sperry Drilling). I am authorized and qualified to make this report and this survey was conducted at the request of COG Operating, LLC for the Carmen 3 Federal.Com 15H API No. 30-015-40539 in Eddy County, New Mexico. I have reviewed this report and find that it conforms to the principles and procedures as set forth by Halliburton Energy Services, Inc. (AKA Sperry Drilling).



Field Engineer

COG Operating LLC.

Carmen 3 Federal Com 15H

Eddy Co., NM

JW Rig #2

API# 30-015-40539-0000

March 11, 2013 To March 25, 2013

HD-MJ-0900265505

Sperry Drilling

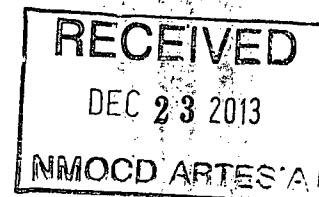
MWD SURVEY Report

Submitted by Jeffrey Moriarty

3950 Interwood S. Pkwy

Houston, TX 77032

Ph: 281.986.4400



HALLIBURTON

**Drilling and Formation
Evaluation**



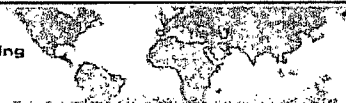


Survey Report for COG Operatering LLC.

Rig : JW Rig #2
Well Name : Carmen 3 Federal Com 15H
Field Name : Glorieta- Yeso
Country : USA
Job Number : HD-XX-0900265505
Job Start Date : 10-Mar-13
API Number : 30-015-40539-0000

**TABLE OF CONTENTS**

1. General Information
2. Directional Survey Data



GENERAL INFORMATION

Company	: COG Operating LLC
Rig	: JW Rig #2
Well	: Carmen 3 Federal Com 15H
Field	: Glorieta- Yeso
Lease Name	: Carmen 3 Federal Com 15H
State	: New Mexico
County	: Eddy County, New Mexico
Country	: USA
API Number	: 30-015-40539-0000
Sperry Drilling Job Number	: HD-XX-0900265505
Job Start Date	: 10-Mar-13
Job End Date	: 25-Mar-13
North Reference	: Grid
Total Correction (deg)	: 7.499
Dip Angle (deg)	: 60.639
Total Magnetic Field (nT)	: 48763
Date of Magnetic Data	: 11 March, 2013
Well Head coordinates N	: 32 deg. 52 min 11.07 sec North
Well Head coordinates E	: 103 deg. 57 min 6.22 sec West
Vertical section direction (deg)	: 269.20
Unit Number	: 11310662
MWD Engineers	: Jeff Moriarty, Sampson Olowo
Company Representatives	: David Foster
Company Geologist:	:

DIRECTIONAL SURVEY DATA

Tie-In

0.00 0.00 0.00 0.00 0.00 N 0.00 E

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100)
100.00	0.44	267.15	100.00	0.02 S	0.38 W	0.38	0.44
200.00	0.43	329.20	200.00	0.28 N	0.96 W	0.96	0.45
300.00	2.18	24.76	299.97	2.33 N	0.35 W	0.32	1.97
400.00	3.27	23.22	399.85	6.68 N	1.57 E	-1.66	1.09
500.00	2.97	23.24	499.71	11.68 N	3.71 E	-3.88	0.30
600.00	2.21	24.04	599.60	15.82 N	5.52 E	-5.74	0.76
700.00	1.91	27.96	699.54	19.06 N	7.09 E	-7.35	0.33
800.00	1.95	29.25	799.48	22.01 N	8.70 E	-9.01	0.06
900.00	1.69	34.59	899.43	24.71 N	10.37 E	-10.71	0.31
1000.00	1.50	34.55	999.39	27.00 N	11.95 E	-12.32	0.19
1100.00	1.37	38.07	1,099.36	29.02 N	13.43 E	-13.83	0.16
1200.00	1.23	40.94	1,199.34	30.78 N	14.87 E	-15.30	0.15
1300.00	1.02	46.15	1,299.32	32.20 N	16.21 E	-16.66	0.23
1400.00	1.03	58.13	1,399.30	33.29 N	17.62 E	-18.08	0.21
1500.00	0.97	59.59	1,499.29	34.20 N	19.11 E	-19.59	0.07
1600.00	0.62	63.49	1,599.28	34.87 N	20.33 E	-20.81	0.35
1700.00	0.46	69.15	1,699.27	35.25 N	21.19 E	-21.68	0.17
1800.00	0.29	69.77	1,799.27	35.48 N	21.80 E	-22.29	0.17
1900.00	0.28	70.47	1,899.27	35.65 N	22.27 E	-22.76	0.01
2000.00	0.23	75.92	1,999.27	35.78 N	22.69 E	-23.19	0.06
2100.00	0.18	68.43	2,099.27	35.89 N	23.03 E	-23.53	0.06
2200.00	0.19	58.24	2,199.27	36.03 N	23.32 E	-23.82	0.03
2300.00	0.10	55.25	2,299.27	36.17 N	23.53 E	-24.03	0.09
2400.00	0.41	54.58	2,399.26	36.43 N	23.89 E	-24.40	0.31
2500.00	0.23	50.42	2,499.26	36.76 N	24.34 E	-24.85	0.18
2600.00	0.37	43.03	2,599.26	37.13 N	24.72 E	-25.23	0.14
2700.00	0.30	49.05	2,699.26	37.53 N	25.13 E	-25.66	0.08
2800.00	0.30	51.70	2,799.26	37.87 N	25.54 E	-26.06	0.01
2900.00	0.51	43.87	2,899.26	38.35 N	26.05 E	-26.58	0.22
3000.00	0.47	36.00	2,999.25	39.00 N	26.60 E	-27.14	0.08
3100.00	0.34	34.46	3,099.25	39.58 N	27.01 E	-27.56	0.13
3200.00	0.35	34.48	3,199.25	40.08 N	27.35 E	-27.91	0.01
3300.00	0.41	36.21	3,299.25	40.62 N	27.73 E	-28.30	0.06
3400.00	0.47	134.15	3,399.24	40.62 N	28.24 E	-28.80	0.67
3500.00	0.31	134.75	3,499.24	40.14 N	28.73 E	-29.28	0.16
3600.00	0.12	200.34	3,599.24	39.86 N	28.88 E	-29.44	0.28
3700.00	0.23	98.11	3,699.24	39.73 N	29.04 E	-29.60	0.28
3800.00	0.10	243.24	3,799.24	39.66 N	29.17 E	-29.72	0.32
3900.00	0.24	120.29	3,899.24	39.52 N	29.27 E	-29.82	0.31
4000.00	0.25	28.23	3,999.24	39.60 N	29.55 E	-30.10	0.35
4100.00	0.10	15.40	4,099.24	39.88 N	29.68 E	-30.23	0.15

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100)
4200.00	0.11	17.56	4,199.24	40.05 N	29.73 E	-30.29	0.01
4300.00	0.17	85.45	4,299.24	40.16 N	29.91 E	-30.47	0.16
4400.00	0.39	62.15	4,399.24	40.33 N	30.36 E	-30.92	0.24
4500.00	0.49	52.03	4,499.23	40.75 N	30.99 E	-31.56	0.13
4600.00	0.16	9.81	4,599.23	41.15 N	31.36 E	-31.93	0.39
4700.00	0.31	140.98	4,699.23	41.08 N	31.55 E	-32.12	0.43
4800.00	0.25	187.84	4,799.23	40.65 N	31.69 E	-32.25	0.23
4900.00	0.16	225.46	4,899.23	40.34 N	31.56 E	-32.12	0.16
5000.00	0.21	275.53	4,999.23	40.26 N	31.28 E	-31.84	0.16
5100.00	0.15	348.95	5,099.23	40.40 N	31.07 E	-31.63	0.22
5176.00	0.07	172.17	5,175.23	40.46 N	31.06 E	-31.62	0.29
5207.00	0.80	238.19	5,206.23	40.32 N	30.88 E	-31.44	2.51
5238.00	3.03	245.49	5,237.21	39.87 N	29.95 E	-30.50	7.22
5269.00	5.85	256.43	5,268.11	39.16 N	27.66 E	-28.21	9.44
5300.00	8.81	255.96	5,298.86	38.21 N	23.83 E	-24.36	9.55
5328.00	11.67	255.39	5,326.41	36.98 N	19.01 E	-19.52	10.23
5359.00	14.50	254.26	5,356.60	35.13 N	12.24 E	-12.73	9.17
5390.00	17.69	256.81	5,386.38	33.01 N	3.92 E	-4.38	10.53
5422.00	20.47	257.20	5,416.62	30.66 N	6.28 W	5.85	8.71
5453.00	23.36	257.17	5,445.38	28.09 N	17.56 W	17.16	9.33
5484.00	25.88	256.56	5,473.56	25.15 N	30.13 W	29.78	8.18
5516.00	28.41	257.14	5,502.03	21.83 N	44.35 W	44.04	7.93
5547.00	31.51	258.07	5,528.89	18.52 N	59.47 W	59.20	10.11
5578.00	34.47	258.81	5,554.88	15.14 N	76.00 W	75.78	9.65
5609.00	37.74	259.58	5,579.93	11.72 N	93.95 W	93.77	10.66
5641.00	40.69	261.10	5,604.72	8.34 N	113.89 W	113.76	9.68
5672.00	43.69	262.49	5,627.68	5.37 N	134.49 W	134.40	10.15
5703.00	47.00	262.84	5,649.47	2.56 N	156.36 W	156.31	10.70
5734.00	50.32	263.42	5,669.94	0.22 S	179.47 W	179.45	10.80
5765.00	52.76	262.50	5,689.22	3.20 S	203.56 W	203.58	8.19
5796.00	55.29	261.97	5,707.43	6.59 S	228.41 W	228.48	8.30
5827.00	57.71	261.55	5,724.54	10.30 S	253.99 W	254.11	7.87
5858.00	60.44	260.56	5,740.47	14.43 S	280.26 W	280.43	9.23
5889.00	63.56	259.82	5,755.02	19.10 S	307.23 W	307.46	10.29
5921.00	66.83	259.00	5,768.44	24.44 S	335.77 W	336.08	10.48
5952.00	69.43	258.68	5,779.99	30.00 S	364.00 W	364.38	8.45
5983.00	73.04	258.25	5,789.96	35.87 S	392.75 W	393.22	11.72
6014.00	77.63	257.77	5,797.80	42.10 S	422.08 W	422.63	14.86
6046.00	82.22	257.74	5,803.40	48.78 S	452.86 W	453.50	14.35
6077.00	86.24	257.36	5,806.52	55.43 S	482.97 W	483.70	13.02
6108.00	86.91	257.85	5,808.37	62.07 S	513.20 W	514.01	2.69
6140.00	88.52	259.61	5,809.65	68.32 S	544.55 W	545.45	7.45
6171.00	89.44	262.61	5,810.20	73.11 S	575.17 W	576.14	10.11
6203.00	91.14	264.53	5,810.03	76.69 S	606.97 W	607.98	8.01
6234.00	91.14	266.18	5,809.42	79.20 S	637.86 W	638.90	5.31



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100)
6265.00	91.20	267.69	5,808.78	80.86 S	668.81 W	669.87	4.88
6296.00	91.23	269.12	5,808.12	81.72 S	699.79 W	700.86	4.62
6327.00	91.17	269.11	5,807.48	82.20 S	730.78 W	731.85	0.20
6359.00	91.17	268.83	5,806.82	82.77 S	762.76 W	763.85	0.88
6454.00	92.07	270.21	5,804.14	83.57 S	857.72 W	858.80	1.73
6548.00	93.05	269.78	5,799.94	83.58 S	951.62 W	952.70	1.14
6642.00	91.51	269.57	5,796.19	84.12 S	1,045.55 W	1046.62	1.65
6736.00	90.86	270.77	5,794.24	83.84 S	1,139.52 W	1140.58	1.46
6831.00	91.48	270.88	5,792.30	82.47 S	1,234.49 W	1235.52	0.66
6925.00	92.13	270.34	5,789.34	81.47 S	1,328.44 W	1329.45	0.89
7019.00	91.36	271.97	5,786.48	79.57 S	1,422.37 W	1423.35	1.91
7112.00	91.17	271.61	5,784.42	76.66 S	1,515.30 W	1516.23	0.43
7206.00	91.54	271.22	5,782.20	74.34 S	1,609.25 W	1610.13	0.57
7300.00	92.25	271.56	5,779.09	72.06 S	1,703.17 W	1704.01	0.83
7394.00	90.62	271.93	5,776.74	69.20 S	1,797.09 W	1797.88	1.78
7488.00	90.52	271.62	5,775.80	66.29 S	1,891.04 W	1891.79	0.35
7581.00	90.43	270.47	5,775.03	64.59 S	1,984.02 W	1984.73	1.24
7675.00	91.29	269.39	5,773.61	64.70 S	2,078.01 W	2078.71	1.47
7769.00	91.60	269.78	5,771.24	65.38 S	2,171.98 W	2172.68	0.53
7863.00	90.31	268.96	5,769.68	66.42 S	2,265.96 W	2266.66	1.63
7957.00	90.74	269.01	5,768.82	68.09 S	2,359.94 W	2360.66	0.46
8050.00	90.77	268.59	5,767.59	70.03 S	2,452.91 W	2453.65	0.45
8144.00	91.17	268.87	5,766.00	72.11 S	2,546.87 W	2547.63	0.52
8237.00	90.83	268.68	5,764.38	74.10 S	2,639.84 W	2640.61	0.42
8330.00	91.11	268.71	5,762.80	76.22 S	2,732.80 W	2733.60	0.30
8423.00	90.62	269.85	5,761.40	77.38 S	2,825.78 W	2826.58	1.34
8517.00	90.46	270.82	5,760.52	76.83 S	2,919.77 W	2920.56	1.04
8610.00	91.76	271.84	5,758.71	74.66 S	3,012.73 W	3013.48	1.78
8703.00	92.50	271.76	5,755.26	71.74 S	3,105.62 W	3106.31	0.80
8797.00	91.35	270.31	5,752.10	70.05 S	3,199.54 W	3200.21	1.96
8891.00	91.60	269.76	5,749.67	69.99 S	3,293.51 W	3294.17	0.65
8985.00	91.70	269.03	5,746.97	70.99 S	3,387.47 W	3388.13	0.78
9079.00	90.77	270.07	5,744.95	71.72 S	3,481.44 W	3482.10	1.48
9172.00	90.46	269.44	5,743.95	72.12 S	3,574.43 W	3575.09	0.76
9266.00	89.88	270.94	5,743.67	71.81 S	3,668.43 W	3669.07	1.71
9360.00	89.91	270.61	5,743.84	70.54 S	3,762.42 W	3763.04	0.35
9453.00	90.56	271.04	5,743.47	69.20 S	3,855.41 W	3856.00	0.83
9547.00	91.11	270.70	5,742.11	67.78 S	3,949.39 W	3949.95	0.69
9640.00	91.60	270.58	5,739.91	66.74 S	4,042.36 W	4042.89	0.54
9735.00	91.82	270.45	5,737.08	65.89 S	4,137.31 W	4137.83	0.27
9828.00	90.96	270.01	5,734.82	65.52 S	4,230.28 W	4230.78	1.04
9922.00	91.45	269.80	5,732.84	65.67 S	4,324.26 W	4324.75	0.57
10015.00	91.97	269.13	5,730.07	66.54 S	4,417.21 W	4417.71	0.91
10109.00	92.03	268.84	5,726.78	68.20 S	4,511.14 W	4511.65	0.31
10130.00	91.70	268.50	5,726.10	68.69 S	4,532.12 W	4532.64	2.27



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
10200.00	91.70	268.50	5,724.02	70.52 S	4,602.07 W	4602.60	0.00

SURVEY FOOTER

SURVEYS CALCULATED USING LONG COLLAR METHOD.

TIE-ON ASSUMED VERTICAL AT SURFACE.

SURVEYS FROM 100.00' MD TO 5100' MD PROVIDED BY VAUGHN ENERGY SERVICE.

SURVEYS FROM 5176' MD TO 10130' MD PROVIDED BY SPERRY DRILLING SERVICES.

SURVEY 10130' MD IS PROJECTED TO BIT AT 10200' MD.

SPERRY ENGINEERS: J. MORIARTY, S. OLOWO

DIRECTIONAL SURVEY DATA NOTES

- Calculation based on minimum curvature method.
- Survey coordinates relative to well system reference point.
- TVD values given relative to drilling measurement point.
- Vertical section relative to well head.
- Vertical section is computed along a direction of 269.20 degrees (Grid)
- A total correction of 7.50 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 10,200.00 feet is 4,602.61 feet along 269.12 degrees (Grid)

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